WHAT IS CLAIMED IS:

1. A road antenna apparatus comprising:

a road antenna disposed above a road and establishing radio communication with an on-vehicle radio device mounted in a vehicle;

a receiver disposed within a communication area on the road;

a controller which controls an operation of the antenna based on a detection of the receiver.

2. The road antenna apparatus as described in claim 1, further comprising:

a laser-beam emitting device which is mounted on the road antenna and radiates a laser beam on the road,

wherein the receiver is a laser-beam receiving device which receives the laser beam emitted from the laser-beam emitting device.

3. The road antenna apparatus as described in claim 1,

wherein the controller controls a transmission output signal level of the road antenna based on a receiving rate of the transmission output signal level.

4. A road antenna apparatus comprising:

a road antenna disposed above a road and establishing radio communication with an on-vehicle

radio device mounted in a vehicle; and

a laser-beam emitting device which is mounted on the road antenna and radiates a laser beam on the surface of the road.

5. The road antenna apparatus as described in claim 4, further comprising:

a laser-beam receiving device mounted on the road and receiving the laser beam emitted from the laser-beam emitting device,

wherein the operation of the road antenna is stopped when the laser-beam receiving device cannot receive the laser beam.

6. A road antenna apparatus comprising:

a road antenna above a road and establishing radio communication with an on-vehicle radio device mounted in a vehicle;

a receiver disposed within a communication area on the road, and receiving a radio wave output from the road antenna, and outputs a signal proportional to the power of the radio wave; and

a controller for determining transmission power of the road antenna on the basis of the signal output from the receiver, the controller controls the road antenna so as to prevent the transmission power of the road antenna from exceeding a predetermined value.

7. The road antenna as described in claim 6, wherein receivers are disposed at respective corners of the communications area,

wherein the controller determines the angle at which the road antenna is mounted based on signals output from the respective receivers, the controller detects an offset in the angle of the antenna with respect to a predetermined angle.

8. A method of setting a communications area, comprising the steps of:

measuring a receiving rate for each of frames of a received signal when a receiver receives a radio wave transmitted from a transmitter;

detecting change in receiving rate on a per-frame basis, the change being induced by a change in a transmission output of the radio wave transmitted from the transmitter; and

setting, into the transmitter, a transmission output obtained when there is detected a receiving rate suitable for a desired communications area established between the transmitter and the receiver.

9. A radio system comprising:

a transmission section including a modulation section for producing a modulation signal;

a gain controller which controls a transmission

output, a power amplification section for amplifying a transmission signal to a desired level, and an antenna; and

a receiving section including:

an antenna;

a frequency converter which converts into an intermediate frequency a high-frequency signal received by way of the antenna;

a demodulation section which demodulates the intermediate frequency,

a decode section which converts a demodulated signal into digital data; and

a receiving rate detector which detects a receiving rate for each of frames of a received signal.

10. A transmitter comprising:

a modulation section which produces a modulation signal;

a gain controller which controls a transmission output;

a power amplification section which amplifies a transmission signal to a desired level; and

an antenna,

wherein the gain controller varies the transmission output on the basis of a receiving rate for

each frame determined when a receiver receives a transmission signal.

11. The transmitter as described in claim 10, wherein the gain controller includes a data setting device and a voltage-controlled amplifier, and can freely change a communication area by means of variation of an amplification gain.

12. The transmitter as described in claim 10, wherein the gain controller includes a data setting device and a voltage-controlled attenuator, and can freely change a communication area by means of variation of an attenuation.

13. The transmitter as described in claim 10, wherein the antenna has a function of adjusting the angle at which the antenna is disposed, by means of a the receiving rate and can freely change a communications area by means of changing the angle.

14. A receiver comprising:

an antenna for receiving a radio wave transmitted from a transmitter;

a frequency converter which converts into an intermediate frequency a high-frequency signal received by way of the antenna;

a demodulation section which demodulates the intermediate frequency;

decode section which converts the demodulated signal into digital data; and

receiving rate detector which detects a receiving rate for each of frames of the received signal,

wherein a communications area can be freely changed by means of changing a transmission output of the transmitter on the basis of the receiving rate for each frame detected by the receiving rate detector.

15. A road antenna apparatus comprising:

a road antenna disposed above a road and establishing radio communication with an on-vehicle device mounted in a vehicle;

Doppler signal processor which detects the traveling direction of the vehicle on the basis of a change arising in the frequency of a reflected wave due to the Doppler effect, the reflected wave being formed when a transmission wave emitted from the road antenna is reflected by the vehicle; and

control means which allows establishment of communication with the vehicle traveling in a predetermined direction.

16. The road antenna apparatus as described in claim 15, further comprising:

reflected wave extraction means which receives the reflected wave and a receipt wave emitted from the

on-vehicle device, the reflected wave extraction means extracts only the reflected wave.

17. A travel-speed support system comprising:

an on-vehicle radio device mounted in a vehicle;

an antenna mounted above a road and establishing radio communication with the on-vehicle radio device; and

determining means provided in the antenna and determining whether the travel speed of the vehicle is appropriate for a speed limit imposed on a road, on the basis of the travel speed of the vehicle based on a signal corresponding to a reflected wave, the reflected wave being produced as a result of a radio emitted from the antenna being reflected by the vehicle.

18. The travel-speed support system as described in claim 17,

wherein the antenna includes:

a receiver which receives a reflected wave, the reflected wave being produced when a radio transmitted to the on-vehicle radio device is reflected from the vehicle; and

a detector which detects a signal received by the receiver and the speed of the vehicle.

19. The travel-speed support system as described in claim 17,

wherein the antenna includes:

speed warning means which compares the travel speed of the vehicle detected by the detector with a predetermined warning speed, determines whether the speed of the vehicle exceeds the warning speed, and issues a warning to the vehicle if the vehicle exceeds the warning speed.

20. An antenna for use with a travel-speed support system, comprising:

on-vehicle radio device mounted in a traveling vehicle;

an antenna disposed at a position above a road, and establishing radio communication with the on-vehicle radio device; and

a speed detector which measures the speed of the traveling vehicle on the basis of a signal corresponding to a reflected wave by means of the Doppler effect when the vehicle approaches or departs from the antenna, the reflected wave being produced when a radio wave is reflected by the vehicle, wherein the road includes both a turnpike and an ordinary road.

21. The antenna as described in claim 20,

wherein the antenna includes:

a receiver which receives a wave which is reflected by the vehicle, as a result of a radio wave being

transmitted to the on-vehicle radio device; and

a detector which detects the signal received by the receiving means and the speed of the vehicle.

22. The antenna as described in claim 20,

wherein the antenna includes:

a speed detector which compares the travel speed of the vehicle as detected by the detection means with a predetermined warning speed, determines whether or not the speed of the vehicle exceeds the warning speed, and issues a warning to the vehicle if the vehicle exceeds the warning speed.

23. A road antenna comprising:

a road antenna disposed above a road and setting a communications area on the road; and

a structure which is located above the road antenna, the side of the structure opposite the road antenna being provided with a radio-wave absorbing material,

wherein radio communication is established between the road antenna and an on-vehicle device mounted in a vehicle traveling on the road and within the communications area.

24. The road antenna as described in claim 23, wherein the radio wave absorbing member is a radio-wave absorbing member.

25. The road antenna as described in claim 23,

wherein the radio wave absorbing member is a paint-like radio-wave absorbing member.

26. The road antenna as described in claim 23, wherein the radio-absorbing member is a multilayer radio-absorbing member.